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10/707,657	12/30/2003	James Kenneth Aragones	61765.005012	1656

7590 06/11/2007  
General Electric Company  
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Schenectady, NY 12301

EXAMINER
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CRAIG, DWIN M

ART UNIT	PAPER NUMBER
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2123

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06/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/707,657	<b>Applicant(s)</b> ARAGONES ET AL.	
	<b>Examiner</b> Dwin M. Craig	<b>Art Unit</b> 2123	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 March 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Claims 1-24 have been presented for reconsideration based on Applicants' arguments and amended claim language.

#### *Response to Arguments*

2. Applicants' arguments presented in the 3/29/2007 responses have been fully considered: the Examiner's response is as follows:

- 2.1 Regarding the previously applied 35 U.S.C. 101 rejections of claims 1-24, the Examiner has found Applicants' arguments presented on page 9 of the 3/29/2007 responses in combination with the instant amendments to the claims to be persuasive and hereby withdraws the previously applied 35 U.S.C. 101 rejections of the same.

- 2.2 Regarding Applicants response to the 35 U.S.C. 103(a) rejections of claims 1-24, on pages 9-18, the Examiner has determined, after careful review of the arguments presented that; Applicant has failed to put forth a specific argument that provides persuasive evidence that the previously presented rejections were in error. More Specifically, Applicant has opined that the cited references fail to disclose or suggest the claimed subject matter and yet the arguments, as presented, are mere recitations of claimed limitations of independent claims 1 and 5, followed by a discussion of what is provided in the cited references and then a statement that the claimed limitations are patentable over the cited prior art, in this case Pettigrew U.S. Patent 5,018,069. For example the arguments on page 10 are a recitation of the newly amended claimed subject matter, followed on page 11 by a discussion of Pettigrew U.S. Patent 5,018,069 and listing the abstract of Pettigrew U.S. Patent 5,018,069, followed by a statement that Pettigrew U.S. Patent 5,018,069 is not equivalent to the claimed subject matter, *Applicants' listed another recitation of*

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*the claimed subject matter*. Merely listing the claimed limitations and then reciting a section of a cited reference and concluding that the claims are patentably distinct is not argument.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Merely reciting the claimed limitations, then citing an abstract for a U.S. Patent used in a rejection and then stating that the U.S. Patent fails to disclose or suggest all of the claimed limitations is not a reasoned argument. Further, and in regards to the arguments as presented on pages 11 and 12 Applicants' have pointed into the specification as to where the support is provided for the newly amended claim limitations, the Examiner is confused as to how showing support for amended claim language applies to an argument regarding patentability over the prior art.

Further, on page 12 of the 3/29/2007 responses Applicants' are merely listing, piece meal, the sections of the Pettigrew U.S. Patent 5,018,069 reference relied upon in the previous Office Action concluding with a statement that none of the referenced portions of the Pettigrew reference teach the claimed limitations, followed by a recitation of the claimed limitations in independent claims 9 & 13. Again, the recitation of the sections of the cited reference, followed by a recitation of the claimed limitations, does not amount to a reasoned argument. Further and in regards to the prior art rejections of claims 9 and 13, Pettigrew U.S. Patent 5,018,069 teaches those same recited claimed limitations, as pointed out in the rejection of claim 1.

The paragraph at the bottom of page 13 appears to be an argument, Applicants' have stated, *In contrast the present patent application discloses a system and method for quantifying*

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*baseline model quality and evaluating the performance of the baseline model.* The Examiner respectfully traverses Applicants' argument, the Examiner notes that the claimed *model* is itself based on data from an *engine service history database* that contains *actual* engine data, see independent claims 1, 5,9,13,17 and 21, and therefore the teachings of Pettigrew, which as Applicant has argued, *by measuring the degree of deviation between various turbine engine performance parameters and actual engine parameter curves* is functionally performing *evaluation performance* of an *engine* that is being *modeled*. Col. 11 lines 39-56 of Pettigrew more specifically, "...in light of the trends of the deviation of the REDD values from the baseline over time" clearly teaches a predictive model being evaluated as regards to performance against the current data and projected data.

Applicants' arguments are respectfully traversed and the previously applied rejections are maintained for the reasons indicated in this office action.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,018,069 Pettigrew in view of US Patent 5,727,128 Morrison.

- 3.1 Regarding claim 1, Pettigrew teaches a system for quantifying baseline model quality, comprising:

an engine service database containing engine data (Col. 3 lines 60-61 "...with stored, standard performance baselines representing engines in good conditions..." and Col. 4 line 39 "...a ground computer database...");

an engine baseline modeling component that builds an engine baseline model from data, wherein the engine baseline model relates engine performance variables as a function of engine operating conditions; (Col. 3 lines 7-54) and a model diagnostics component that evaluates the performance of the engine baseline model (Col. 2 lines 19-46 "...engine diagnostic data (REDD) format..."),

wherein the model diagnostics component includes: means for comparing engine data from a plurality of engines against the engine baseline model (Col. 3 lines 10-20); means for



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generating engine trends for each of the plurality of engines (Col. 3 lines 66-67 and Col. 4 lines 1-4); means for identifying correlations between the engine trends (Figure 5 #250 and Col. 11 lines 39-56 specifically, “...*in light of the trends of the deviation of the REDD values from the baseline over time*” clearly teaches a predictive model being evaluated as regards performance against the current data and projected data.) and various parameters (Col. 4 lines 2-4 “...are an indication of the degree of deviation between these actual functions and standard baselines...” and Col. 3 lines 20-67); and means for calculating, for each identified correlation (Figure 2 # 112 and Col. 4 lines 35-66), summary statistics relating to the degree of correlation (Figure 2 #120 and Figure 3, Col. 2 lines 64-66 and Col. 11 lines 8-23) see also Col. 5 lines 5-34, Table 1 and Col. 10 lines 5-9.

Regarding the newly amended limitations and using independent claim 1 as an example, *wherein the model diagnostics component uses the summary statistics to evaluate the performance of the engine baseline model, and wherein the system is configured to use the engine baseline model to perform at least one of monitoring engine status, predicting future engine behavior, diagnosing engine faults, determining engine performance, determining engine quality and designing new engine systems.*

The expressly claimed limitation, *wherein the model diagnostics component uses the summary statistics to evaluate the performance of the engine baseline model*, is clearly a *wherein* or *whereby* clause that is teaching an intended use of the *model diagnostics component*. The Examiner notes that according to MPEP section 2111.04 states, “*whereby clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited*” It would be obvious that if a *model diagnostics component* is generating summary

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*statistics* that the *statistics* would be used to evaluate engine data, specifically *Pettigrew* teaches that the *baseline* data is used to evaluate the performance of the engine, see item 242 in Figure 5 which shows using the result from one process and using that result to evaluate engine data, see also the descriptive text regarding figure 5.

Regarding the limitation, *wherein the system is configured to use the engine baseline model to perform at least one of diagnosing engine faults* *Pettigrew* clearly teaches diagnosing engine faults (item 251, Figure 5 “Check Diagnostics Matrix for Area to Compare” see also the descriptive text).

However, *Pettigrew* does not expressly disclose a preprocessor for processing the engine data into a predetermined format.

*Morrison* teaches a preprocessor for processing the engine data into a predetermined format (Col. 3 lines 1-8) and *Morrison* also teaches determining means for the correlation of data to a model (Col. 5 & 6).

*Pettigrew* and *Morrison* are analogous art because they are in the same problem solving area of statistical model of data to determine trends.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the data processing methods of *Morrison* in combination with the engine baseline methods of *Pettigrew*.

The motivation for doing so would have been to provide an efficient method of training a neural network in order to correlate data to a model of a process or more specifically address the problem as disclosed by the call of applicants’ claims, the ability to diagnose a baseline model by comparing baseline data with a model (see *Morrison* Col. 5 lines 18-37).



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Therefore, it would have been obvious to combine Morrison with Pettigrew to obtain the invention in claims 1-24.

3.2 Regarding claim 2, Pettigrew does not expressly disclose means for identifying correlations between engine trends and various parameters further generate correlation coefficients for each identified correlation.

Morrison teaches (Col. 4 & 5).

3.3 Regarding claim 3, Pettigrew teaches a standard deviation therefore meets the call of the claim (Figure 4 #224 and Col. 7 lines 52-68).

3.4 Regarding claim 4, Pettigrew teaches the functional equivalent of wherein a good model is best represented by summary statistics tending toward zero (Figure 3 and Col. 2 lines 47-53 not that if the "*model*" is "*good*" then properly operating components are not removed see also Morrison Col. 4 lines 29-43 "...a low PLS sensitivity value (near 0.0)...").

3.5 Regarding claim 5, the rejection of claim 1 substantially teaches all of the limitations as disclosed in claim 5 with the exception that claim 5 claims a means for plotting data points as well as a means for curve fitting (or smoothing). Pettigrew discloses a means for plotting data points (Figure 2 # 120 and Col. 4 lines 44-49), and Morrison discloses means for time-varying analysis and means for smoothing a curve (Col. 4 lines 22-29 "...applies a line-fit to a set of input and output data..." and regarding time-varying data see Morrison Col. 8 lines 11-31).

3.6 Regarding claim 6 Pettigrew does not expressly disclose, wherein residual errors computed reflect the amount by which each trend point varies from the smoothed curve.

However, Morrison teaches (Col. 4 lines 22-29 "...applies a line-fit to a set of input and output data..." and regarding residual errors see Col. 4 lines 22-30).

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3.7 Regarding claim 7 the examiner notes that a *sigma* is a figure of merit for standard deviation and therefore any teaching of a standard deviation teaches *sigma* being calculated for a set of data points. Therefore, while Pettigrew does teach the calculation of means Morrison goes further and discloses the functional equivalent for determining a statistical figure of merit or a sigma (see Col. 9 lines 2-9 "...any desired type of statistical variables such as means, mediums, minimums, maximums, standard deviations, etc...") in view of the combined teachings the claimed limitations of claim 7 are obvious.

3.8 Regarding claim 8, Pettigrew does not expressly disclose, wherein a good model is best represented by lower estimated sigma values, however Morrison teaches the functional equivalent of this claimed limitation, see Col. 15 lines 9-64 of Morrison for a discussion of how a model is qualified and made "good" see also the rejection of claim 4 above.

3.9 Regarding claim 9, see the rejection of claim 1 above.

3.10 Regarding claim 10, see the rejection of claim 2 above.

3.11 Regarding claim 11, see the rejection of claim 3 above.

3.12 Regarding claim 12, see the rejection of claim 4 above.

3.13 Regarding claim 13, the rejection of claim 1 substantially teaches all the limitations as presented in claim 13 with the following exceptions, claim 1 does not claim plotting data points or fitting a smoothed curve or computing residual errors. Pettigrew teaches a means for plotting data points (Figure 2 # 120 and Col. 4 lines 44-49), and Morrison teaches a means for time-varying analysis and means for smoothing a curve (Col. 4 lines 22-29 "...applies a line-fit to a set of input and output data...") further and in regards to residual errors Morrison teaches (Col. 4 lines 22-30).

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3.14 Regarding claim 14, Pettigrew teaches how each trend point varies from a curve (see the plot in figure 3) however Pettigrew does not expressly disclose smoothing a curve, However Morrison discloses (Col. 4 lines 22-29 "...applies a line-fit to a set of input and output data...").

3.15 Regarding claim 15 see the rejection of claim 7 above.

3.16 Regarding claim 16 see the rejection of claim 8 above.

3.17 Regarding claim 17 see the rejection of claim 1 above.

3.18 Regarding claim 18, see the rejection of claim 2 above.

3.19 Regarding claim 19, see the rejection of claim 3 above.

3.20 Regarding claim 20, see the rejection of claim 4 above.

3.21 Regarding claim 21, see the rejection of claim 5 above.

3.22 Regarding claim 22, see the rejection of claim 6 above.

3.23 Regarding claim 23, see the rejection of claim 7 above.

3.24 Regarding claim 24, see the rejection of claim 8 above.

### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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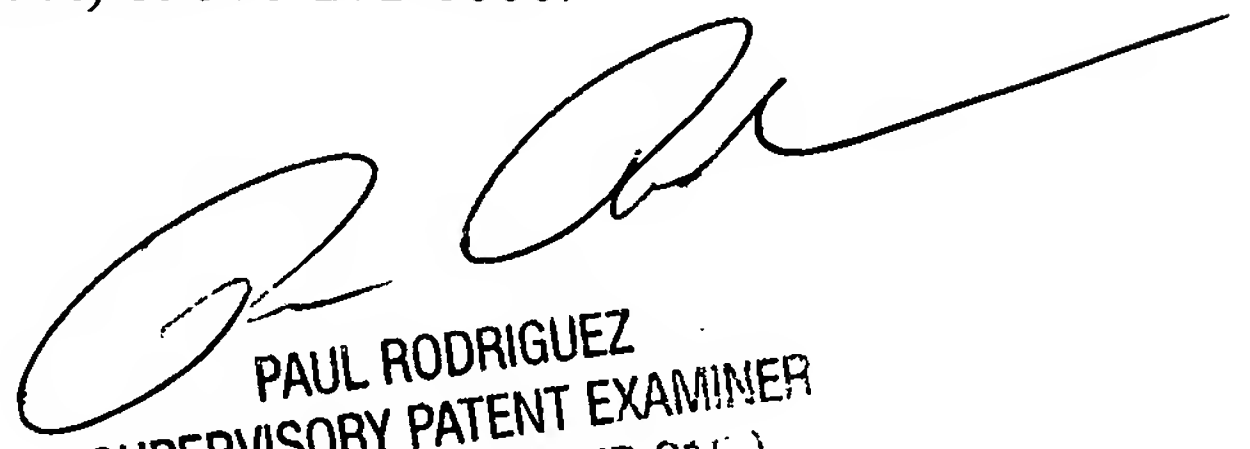
however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

4.1 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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